ART. XXX.—*A Treatise on Human Physiology; designed for the Use of Students and Practitioners of Medicine.* By JOHN C. DALTON, M.D., Professor of Physiology and Hygiene in the College of Physicians and Surgeons, New York, etc. Sixth edition, revised and enlarged. With 316 illustrations. 8vo. pp. 825. Philadelphia: Henry C. Lea, 1875.

A Text-Book of Human Physiology; designed for the Use of Practitioners and Students of Medicine. By AUSTIN FLINT, Jr., M.D., Professor of Physiology and Physiological Anatomy in the Bellevue Hospital Medical College, New York, etc. Illustrated by three lithographic plates, and 313 wood-cuts. 8vo. pp. 978. New York: D. Appleton & Co., 1876.

PROF. DALTON'S work has been so long and so conspicuously before the medical public, and has been so often reviewed in the pages of this Journal, that it no longer requires any extended notice at our hands. Its success is amply shown by the fact that the fifth edition, which appeared in 1871, has been exhausted in the short space of four years. In its present form the work has been considerably enlarged. Nearly one hundred pages and thirty-two illustrations have been added. Many portions have been re-written, and as the pages have been enlarged by a new typographical arrangement, the matter of the volume has been increased at least fifty per cent. That part, in the section on nutrition, devoted to the consideration of the physiological chemistry of the solids and fluids of the organism, has been extensively revised. New facts concerning the proximate principles composing the human body have been introduced, while the advanced views now held as to the relation of these principles to each other in the process of nutrition are concisely and clearly stated. An entire chapter has been appropriated to the description of the colouring matters, which in the preceding edition were dispatched in a page and a half; and a new chapter has been introduced treating of lecithine, cerebrine, leucine, and other crystallizable nitrogenous substances. The chapter on food has also been altered and considerably extended. The description of the function of digestion has not been much changed, though several new illustrations have been introduced into this portion of the work. In view of the remarkable facts collected by Darwin in his recent work on "Insectivorous Plants," our author is scarcely warranted, we think, in asserting, as he does in this, as well as in the former editions of his work, that the digestive "process does not occur in vegetables." A noticeable defect in previous editions of Prof. Dalton's Treatise is still apparent in the one now under consideration. The important and very complex, though quite well understood processes of mastication and deglutition are passed by unnoticed. The student looks into Dr. Dalton's pages, in vain, for any description of the mechanism of these acts.

In the chapter upon the bile much new matter has been introduced in the form of a description of the minute anatomy of the liver, and an account of the optical properties which are exhibited by the bile. The spectral analysis of the animal fluids has lately been assuming so much importance, that we recommend to our readers the perusal of Dr. Dalton's remarks on the subject, in the volume under notice, embodying as they do the results of our author's special investigations upon this subject.

A brief account of the spectral analysis of the blood has been added to the chapter which treats of that fluid. In this chapter we find the following judicious remarks upon the differential diagnosis, between human blood and that of animals:—

> "If a blood stain, accordingly, which in a watery solution gives the common spectrum of hemoglobine, be found to contain oval nucleated globules, this would show it to be the blood of a bird, reptile, or fish; and the oval form alone would show that it is not human blood. The question, therefore, whether a particular specimen be composed of human blood may often be decided with certainty *in the negative* by microscopic examination. But if the specimen contain circular globules, without nuclei, it will be impossible to say positively, in any instance, that they belong to human blood, and not to that of some animal, such as the ape or the dog, whose red globules nearly approach the human in size. In most of the domesticated quadrupeds, the globules are smaller than in human blood; but in both the sloth and the elephant, they are larger. If it were only required to decide whether a given specimen of fresh blood belonged to man or to the musk deer, for example, or even to the goat, no doubt the difference in size of the globules would be sufficient to determine the question.
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> "But within nearer limits of resemblance it would be doubtful, because the size of the red globules varies to some extent in each kind of blood; and in order to be certain that a particular specimen were human blood, it would be necessary to show that the smallest of its globules were larger than the largest of those belonging to the animal in question, or *vice versa*. The limits of this variation have been tolerably well defined for human blood, but not sufficiently so for many of the lower animals to make an absolute distinction possible.
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> "In the examination of stains or blood spots, the difficulty is increased by the fact that the drying and subsequent moistening of the globules introduces another element of uncertainty as to their exact original size."

In the chapters on respiration and calorification, the chemical changes in the respired air and in the blood, and the mode of production and regulation of animal heat have been more elaborately discussed than in former editions of Prof. Dalton's work. Several pages descriptive of the anatomical structure and arrangement of the lymphatic system have been introduced into the chapter which treats of the physiology of this portion of the organism.

In the fifth edition of his work, Prof. Dalton devoted an entire chapter to the function of secretion. This chapter has been left out of the present edition, much to the disadvantage, we think, of the student, who would have looked in vain for any account of the lachrymal, sebaceous, meibomian, ceruminous, and other secretions. Mucus is briefly alluded to under the head of albuminous proximate principles, milk in the article on food, and perspiration as a means of regulating animal heat. This is certainly a defect which should be remedied in the future issues of the work.

The chapter on the urine has been extended and revised. It is, however, in the section devoted to the nervous system and the special senses that the greatest changes and additions of new material have been made. Within the past few years investigations in the field of nervous physiology have been pushed forward with extraordinary activity. Many new facts of a remarkable character have been discovered, and the views once held of the action of the nervous system have been largely modified. Prof. Dalton has accordingly made many judicious alterations in his description of the structure, properties, and mode of action of the brain, spinal cord, ganglionic system, and the cranial and spinal nerves. About 267 pages, or one-third of the entire work, are occupied with the consideration of this subject.

With the exception of some additional remarks upon the origin of plants and animals, upon spontaneous generation, and upon the successive stages of the development and differentiation of the blastodermic membrane, the section on reproduction remains substantially the same as in former editions.

In the present issue of his "Treatise" our author has adopted the new chemical notation and nomenclature, and the centigrade system of measurements for length, volume, and weight; while temperatures are given in degrees of the Centigrade scale, usually accompanied by the corresponding degrees of Fahrenheit's scale, inclosed in brackets. It would have been more consistent and certainly more advantageous, by facilitating the reading of the student, if the foreign measurements of length, etc., had also been accompanied by their English equivalents. Very few students and practitioners are able, at sight and without calculation, to obtain an adequate idea of the weight, volume, or length of bodies when expressed in terms of the decimal system. By placing the equivalent figures side by side, in all cases in which such measurements are referred to, the student is gradually and insensibly taught to appreciate correctly foreign metrical expressions.

We turn now to a brief examination of Prof. Flint's *Text-book of Human Physiology.* This is simply an abridgment or condensation of the author's larger work recently completed in five volumes, and from time to time fully analyzed in former numbers of this Journal. While, on the one hand, the numerous bibliographical citations and historical references contained in the larger work have been excluded from the "text-book," on the other, many admirable illustrations have been introduced, derived, for the most part, from the works of Sappey, Haeckel, Robin, Marey, Dalton, Woodward, and other foreign and domestic authors. The introduction of so many well-executed wood-cuts and plates serves to lighten the labour of the student, by illustrating the text, and thus enhances very materially the educational value of the work.

In turning over the pages of Prof. Flint's "Text-book," we notice that more has been done in the way of condensation than of revision of the material of his *Physiology of Man.* In the former work the frequent repetitions which needlessly increased the size of the latter have been avoided, some additions have been made, and certain changes of opinion expressed. These additions, however, have been too few to materially change the work. It is not, therefore, necessary to present our readers with an analysis of its contents. Suffice it to say, that we consider the work to be an important addition to American medical literature, and cordially commend it to both students and practitioners as a valuable manual of the science of physiology. J. A. M.

ART. XXXI.—*Vision: its Optical Defects and the Adaptation of Spectacles. Embracing, First, Physical Optics; Second, Physiological Optics; Third, Errors of Refraction and Defects of Accommodation, or Optical Defects of the Eye.* With Seventy-four Illustrations on Wood, and Selections from the Test-Types of Jaeger and Snellen. By C. S. FENNER, M.D. 8vo. pp. 299. Philadelphia: Lindsay and Blakiston, 1875.

IN proposing to give to a work on physiological optics, and the errors of refraction and accommodation, "a concise and popular yet comprehensive form," the author has set himself a most difficult task, which he has partially succeeded in accomplishing. A scientific book which adds absolutely nothing to the existing stock of knowledge on the subjects of which it treats, has no other "raison d'etre" than its claim to teach systematically and clearly what is already known; and Dr. Fenner's book must be judged entirely by this standard.

The subject is divided into three sections: First, physical optics; second,